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10/026,269	12/21/2001	Krishna G. Sachdev	FIS920010327US1	7900

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EXAMINER

KORNAKOV, MICHAIL

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

10/026,269

Applicant(s)

SACHDEV ET AL.

Examiner

Michael Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10 and 12-20 is/are rejected.
- 7) ☒ Claim(s) 5, 11 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>05/15/2002</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 13 is objected to because of the following informalities: the last sentence in claim 13 is apparently not finished. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-4, 6, 7, 8, 9, 10, 12, 13, 15, 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futch et al (U.S. 4,934,391) in view of Sachdev et al (U.S. 5,888,308).

Futch discloses a method for the removal of soldering flux from contaminated surfaces. The cleaning compositions of Futch contain dibasic acid esters in combination with an appropriate emulsifying surfactant (abstract). Cleaning compositions comprising dibasic ester compounds, including aliphatic dibasic acid esters, such as dimethyl succinate, dimethyl adipate, or dimethyl glutarate, or aromatic dibasic acid esters such as diethyl phthalate, or mixtures of any of these. These compounds, which have the ability to dissolve or otherwise remove rosin solder fluxes. Preferably, however, the dibasic ester compounds are combined with appropriate emulsifying surfactants to facilitate removal by water (col.3, lines 55-65, col.4, lines 44, 50). These are water insoluble hydrophobic solvents in combination with surface active agent, as defined in steps (a) and (b) of the instant claim 1. Surfactants are nonionic, anionic, cationic or amphoteric surfactants, and preferably nonionic surfactants such as condensation products of alkylene oxides, for example ethylene oxide, with any of a variety of hydrophobic moieties, as are well known in the art, such as ethoxylated aliphatic alcohols and their derivatives (col.5, lines 3-8). The quantity of the combined emulsifying agent in the present composition will vary, depending on the particular ester

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or combination of esters used. Generally, the added emulsifying agent will range, on a weight basis, from about 0-40% of the composition (col.4, lines 61-68).

With regard to the steps of the process, Futch discloses an example for rosin flux removal, wherein the printed/wired circuit board was immersed in dip tank comprising the above described hydrophobic solvent with surfactant (also can be used immersion spraying (col.6, lines 50-64). The temperature at which composition may be applied is 70-150F (corresponds to the instantly claimed range in Celcius). This reads on steps (A) and (b) of the instant claim 1. Once the flux has been loosened and solubilized during a period of contact which typically ranges from about 1 to about 5 minutes, the compositions of the invention are removed. Removal of the compositions can be carried out by flushing with a non-toxic, miscible solvent (col.7, lines 9-15). This reads on steps (c) and (d) of the instant claims. Futch further provides more detailed description of such in Example 6 of col.7 and 8, wherein on the first step the rosin flux was cleaned with a composition comprising a hydrophobic solvent and combination of surfactants (Example 6.1, col.7, line 60). This corresponds to steps (a, b). The board was then removed from the first solvent and washed with water (corresponds to step c). After that the board was cleaned in an ultrasonic bath with methylene chloride (readable on second hydrophobic solvent of the instant claim 1) to remove all traces of residual flux(col.8, lines 24-26). This corresponds to step (d) of the instant claim 1. The board was then removed and rinsed with deionized water and oven dried (col.8, lines 26, 27). This corresponds to steps (g) and (h) of the instant claim 1.

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The disclosure of Futch differs from the instant claim 1 by:

- a) Immersing the assembly into the first solution for a shorter period of time;
- b) not disclosing step (f) of the instant claim 1.

Sachdev discloses a method for rosin flux residue removal (abstract), wherein in place of environmentally hazardous halogenated solvents the hydrophilic solvents aqueous solutions comprising an alkali metal salt and surfactants solution that consists of a high boiling water soluble organic solvent, and wherein said high boiling water soluble organic solvent is selected from the group consisting of benzyl alcohol, dipropylene glycol alkyl ethers, tripropylene glycol alkyl ethers, 3-methoxy-1-butanol, **methoxy propanol** and mixtures thereof. Methoxy propanol is a synonym of propylene glycol methyl ether of step (f) of the instant claim 1 (claim 24). The composition can be applied by immersion with pressure spray (col.11, lines 20-25)

Since both Futch and Sachdev disclose the method for removal of rosin flux residue with environmentally safe compositions, and since Futch suggests the use of alkylene oxides (genus) and Sachdev utilizes the species of such genus for the same purpose, those skilled in the art would have found obvious at the time the invention was made to utilize **methoxy propanol** of Sachdev after the application of a hydrophobic solvent of Futch in order to increase affinity of the cleaning composition to water and to provide complete removal of a hydrophobic component.

With regard to the time of exposure, it noted that discovery of optimum value of result effective variable in known process is ordinarily within the skill in the art and would have been obvious, as per **In re Boesch and Slaney** 205 USPQ 215 (CCPA

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1980), and therefore lacking showing criticality of a particular time of exposure those skilled in the art at the time the invention was made would have found optimum time of exposure via routine experimentation.

With regard to claim 2, Futch does not specifically disclose the hydrophobic solvent of the claimed formula, however, Futch describes the genus of such in col.5, lines 4,5. Therefore, those skilled in the art at the time the invention was made would have found obvious to utilize specific specie as instantly claimed within the genus of ethoxylated aliphatic alcohols and their derivatives of Futch with the reasonable expectation of success.

With regard to claim 6 Futch does not emphasize that the first and second hydrophobic solvents are the same. However, Futch provides the alternative that only one hydrophobic solvent is used, and teaches that the flux residue should be loosened or solubilized by such procedure. Therefore it is obvious to those skilled in the art that the immersion step in the same solution can be repeated several times until the rosin flux residue is substantially loosened with the reasonable expectation of success.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Futch in view of Sachdev and in view of Sugita (U.S. 5,218,979)

Sachdev and Futch do not disclose the use of Nitrogen during drying step. Sugita discloses a method for removal of rosin flux residue from substrates, wherein baked rosin flux on the boards is put into contact with the composition for a sufficient period of time to solubilize the flux, followed by removal of the composition from the boards. When the composition consists essentially of the dimethylcyclooctadienes

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(hydrophobic) , the boards are contacted therewith, rinsed with alcohols (hydrophilic) and then with water. After removal of the composition as above set forth, the boards are dried with nitrogen or the air, to provide boards from which the rosin flux has been completely removed therefrom. Thus Sagita recognizes the equivalency of air and nitrogen for drying purposes in essentially similar process to those of Futch, Sachdev and that instantly claimed. In the instant case substitution of equivalent methods requires no express motivation, as long as the prior art recognizes equivalency, In re Fount 213 USPQ 532 (CCPA 1982); In re Siebentritt 152 USPQ 618 (CCPA 1967); Graver Tank & Mfg. Co. Inc. V. Linde Air products Co. 85 USPQ 328 (USSC 1950).

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Futch in view of Sachdev and further in view of JP03004587.

JP'587 discloses the cleaning method of a printed board without being accompanied by pollution wherein the residual flux of the printed board is removed by a water soluble cleaning agent, the cleaning agent is removed with water or warm water, and the printed board is heated at a prescribed temperature and dried up in a vacuum under a specific pressure or below. The board P is heated at a temperature of 50°C or above in a heating device 10 and dried up in a vacuum of 200Torr or below in a vacuum dryer 1.

Therefore, it will be obvious to those skilled in the art to dry the board in vacuum, as routinely done in the art and as shown by JP'587 in the process of Futch/Sachdev for complete removal of water, and thus to arrive at the instant claim 20.

Allowable Subject Matter

7. Claims 5, 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The references of record individually or in combination do not teach or suggest the application of an ionic surfactant, which comprises rosin flux and benzyl alcohol, as per instant claim 5 and/or its individual constituents, abietic acid, dihydrabietic acid, tetrahydroabietic acid, dehydroabietic acid, and mixtures thereof, in combination with non-ionic surfactants of claim 11 as attributed to the claimed process.

Drawings

8. This application is filed with informal drawings. The informal drawings filed in this application are acceptable for examination purposes. When the application is allowed, applicant will be required to submit new formal drawings.

9. Other prior art references cited in PTOL-892 show the state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Kornakov

2/5/04

Michael Kornakov
Examiner
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